

TEACHING METHODOLOGIES UTILIZED
BY NURSE EDUCATORS
TO ENHANCE CRITICAL THINKING
IN NURSING STUDENTS
A RESEARCH PAPER
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Abstract

RESEARCH PAPER: Teaching Strategies Utilized by Nurse Educators to Enhance Critical Thinking Skills of Nursing Students

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New graduate nurses are expected to have critical thinking skills when entering professional practice. Therefore nurse educators are challenged to prepare students for a complex health environment. The purpose of this descriptive study is to examine teaching strategies used by faculty to develop critical thinking skills of students. This is a replication of Elliott's (2003) study. The framework is the definition of Critical Thinking (Scheffer & Rubenfeld, 2000). The target population is all nurse educators teaching in the Ivy Tech community College system in Indiana. The anticipated sample is 100 nurse educators. Data will be collected using a descriptive survey developed (Elliott) to describe teaching strategies used to enhance critical thinking skills, and frequency of use. Results will provide information about teaching strategies to enhance critical thinking skills of baccalaureate nursing students for enhancing critical thinking methods used by nurse educators.

Chapter 1

Introduction

A highly complex health care system has developed due to mergers, changes in insurance policies, Medicaid and Medicare reimbursements, and advancing technology (Nickitas, 2009). Medicaid and Medicare have reduced reimbursement rates to hospitals, resulting in higher acuity levels and shorter lengths of stay. The healthcare system also needs to address issues of quality of care and cost reduction. Critical thinking is an essential skill for the graduate nurse in this complex, fast paced and ever changing health care environment (Hines & Yu, 2009).

During difficult economic times Americans are looking for better health care outcomes. There is a demand for a healthcare system that is affordable and accessible to everyone. The financial crisis in America is affecting healthcare and good critical thinking skills are essential in providing good patient care with reduced reimbursements. Currently 46 million Americans are without health insurance and many are forced to choose between paying the electric bill and receiving health care. This trend will lead to more serious health issues than if the health problem was addressed in the early stages (Gardner, 2008).

The changing reimbursement landscape provides an opportunity for nurses to demonstrate good critical thinking skills. Smart, evidence based decision- making skills using the principles of human and fiscal resources are required for nurse leaders,

Medicare and Medicaid are denying reimbursement for a growing list of adverse events. Good critical thinking skills can reduce errors, and therefore institutions are looking for new graduate nurses with good critical thinking skills (Tanner, 2008). The National League of Nursing Accreditation Commission (NLNAC) (2008) and the National League for Nursing (NLN) (2008) require Schools of Nursing to promote critical thinking skills, naming critical thinking as a core competency for Baccalaureate and Masters' degree programs. The NLNAC requires the graduate nurse to demonstrate reflection, critical thinking and problem solving skills. Evidence that students are meeting requirements must be provided to maintain accreditation. Critical thinking/clinical decision making is an expected outcome for nursing education (NLNAC, 2008). Clinical judgment is more important than ever before and needs to be evidence based. Nurses need to demonstrate the validity of the outcomes that are predictable to avoid further reductions in reimbursement and less than optimal outcomes for the patient (Tanner, 2008).

The challenge of current times is to prepare nursing students for the complex health care environment. New graduates are expected to move from novice to competent skill levels in a very short period of time using critical thinking skills (Tanner, 2006). Critical thinking is increasingly important in today's complex health care system. Helping nursing students enhance critical thinking skills has become a priority of educators in nursing programs. Faculty need to identify effective strategies used to enhance critical thinking skills in nursing students. Service Learning, role playing, reflective learning, critical incidence conference, videotaped vignettes, preceptorship, and concept mapping have been identified as effective teaching strategies to enhance critical

thinking in nursing students (Tanner, 2006). Further study is needed to examine how faculty teaches critical thinking skills.

Background and Significance

Critical thinking is not a new concept; it may be argued that critical thinking is another name for the scientific method. The organizing framework for professional nursing practice has been the nursing process, involving assessment, nursing diagnosis, planning, implementation, and evaluation (Tanner, 2006).

The concept of critical thinking has been difficult to define and measure, but it has origins as far back as Plato and Socrates. The Socratic Method was described as a pedagogy technique. The educator asks a series of questions, guiding the student towards a deeper awareness of the issue. Current definitions of critical thinking are not specific to the nursing profession. A lack of consensus on a nursing specific definition for critical thinking becomes a barrier to enhancing critical thinking skills in nursing students (Shell, 2001; Tanner, 2006; Twibell, Ryan, & Hermiz, 2005).

Many nursing faculty believe that critical thinking is much more than the nursing process, involving thought processes that often include opposing viewpoints in different situations. Based on a Delphi study “habits of the mind” have been identified as: components of critical thinking, confidence, creativity, flexibility, inquisitiveness, intellectual integrity, contextual perspective, intuition, reflection and perseverance. In nursing, critical thinkers use the cognitive skills of analyzing, information seeking, logical reasoning, applying standards, predicting and transforming knowledge (Scheffer & Rubenfeld, 2000).

There continues to be a lack of consensus of definition and measurement regarding critical thinking (Tanner, 2005; Twibell et al., 2005). The definition quoted by Paul (1995, p. 90) “Critical thinking is the art of thinking about your thinking while you are thinking in order to make it better, more clear, accurate, and defensible,” continues to be used today. Scheffer and Rubenfeld’s (2000) study identified and defined the 10 habits of the mind and 7 cognitive skills of critical thinking in nursing. The definitions have similarities and differences to be examined.

A research study describing the practices used to measure and evaluate critical thinking gave insight into prevailing methods used, however no consensus was reached regarding definition. The study of the 43 NLN accredited baccalaureate programs reported definitions that were specific in regard to the affective and cognitive qualities of critical thinking. Of the programs surveyed, 10 definitions of critical thinking were identified as well as a variety of standardized tests and assessment tools (Videbeck, 1997).

Elliott’s descriptive study (2003) provided additional insight into effective teaching methodologies used by nurse educators to enhance critical thinking in the classroom and clinical setting. The study of 639 nurse educators in baccalaureate programs from Arkansas, Mississippi, and Louisiana identified methods used to enhance critical thinking today. The study did not provide insight into significant differences in methods used by nurse educators to enhance critical thinking in nursing students (Elliott, 2003).

Purpose of the study

The purpose of this study is to describe methods used by nurse educators to enhance critical thinking skills in nursing students. This is a partial replication of Elliott's (2003) study.

Research Question

What methods are used by nurse educators to enhance critical thinking skills in nursing students?

Organizing Framework

Scheffer and Rubenfeld's (2000) definition of critical thinking is the organizing framework for this study. The definition is comprehensive and describes the cognitive and affective components of critical thinking. The habits of mind identified by Scheffer and Rubenfeld are used by nurse educators currently.

Definitions of Terms

Conceptual definition of Critical Thinking Skills.

Critical thinking is an integral component of professional practice in nursing. The habits of mind are used by critical thinkers in nursing practice. The habits of mind include: inquisitiveness, open-mindedness, contextual perspective, flexibility, creativity, confidence, intuition, perseverance, and reflection. The cognitive skills utilized by nurses who are critical thinkers include: analyzing, discrimination, information seeking, logical reasoning, application of standards, and transformation of knowledge (Elliott, 2003).

Operational Definition: Methods used to teach critical thinking.

A questionnaire, Survey of Methods Used by Nursing Faculty to Enhance Critical Thinking in Nursing Students was developed by Elliott (2003) to identify methods used by nurse educators to enhance critical thinking in nursing students. The questionnaire consisted of two parts. Part 1 lists 10 methods of enhancing CT in nursing students. Part 2 uses a Likert scale to identify how often each method is used (Elliott, 2003).

Limitations

This study will be conducted among nursing faculty from one state and one teaching institution, using the selected sample. This study may not be generalizable because of the sample size and the location of the Schools of Nursing. The faculty in this study is from one state (Indiana) and one College (Ivy Tech community College).

Assumptions

Nursing faculty will have taught in the classroom and clinical setting to be able to identify the methods used to enhance critical thinking in nursing students. The faculty will be knowledgeable in the use of the various methods used to enhance critical thinking in nursing students.

Summary

Critical thinking is a requirement of the NLNAC (2008), an accreditation body for the nursing profession. To enhance critical thinking in nursing students, educators need to be aware of the methods used to enhance critical thinking in nursing students. Scheffer and Rubenfeld's (2000) definition of critical thinking is the organizational framework for this study. The purpose of this study is to identify methods used by nurse educators to

enhance critical thinking skills in nursing students. This is a partial replication of Elliott's (2003) study.

Chapter II

Literature Review

The National League for Nursing has published standards and criteria for the accreditation that includes critical thinking as an outcome for baccalaureate, associate, and diploma programs (National League for Nursing Accreditation Commission, 2002). The National Council for State Boards of Nursing (2001) has integrated test questions assessing critical thinking skills within the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Since the National League for Nursing and the National Council for State Boards of Nursing have published statements on the importance of critical thinking, effective methodology to accomplish these goals is very important.

Purpose of the Study

The purpose of the study is to identify teaching methods used by nurse educators to enhance critical thinking skills in nursing students.

Statement of organization of the Literature

The literature review is composed of selected research articles on methods of teaching critical thinking and methods of measuring critical thinking in nursing students.

The literature is divided into seven sections:

1. Conceptual framework
2. Faculty perceptions of teaching critical thinking

3. Changes in critical thinking over time
4. Teaching strategies to improve critical thinking
5. Barriers to teaching critical thinking
6. Predictors of critical thinking
7. Instrumentation for critical thinking

Conceptual Framework:

A Consensus Statement on Critical thinking in Nursing

The last decade has brought much debate about critical thinking in nursing; however there has not been a clear consensus on the definition, measurement and application of critical thinking. Scheffer and Rubenfeld's (2000) definition of critical thinking provides an organizing framework using concepts that can be used to develop, implement and evaluate critical thinking in nursing students. The consensus definition on critical thinking in nursing students is as follows:

Critical thinking in nursing is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge (Scheffer & Rubenfeld, 2000, p. 357).

Scheffer and Rubenfeld's (2000) definition of critical thinking is the conceptual framework for this descriptive study, using concepts familiar to nursing educators and

allowing for the critical components of development, implementation and evaluation of critical thinking in nursing students.

The purpose of this study was to define critical thinking and develop a consensus definition for nursing. An international panel of expert nurses from nine countries participated in a Delphi technique with five rounds of input to achieve this goal. Nurses participating in this study were located in: Japan, Korea, Brazil, Thailand, Canada, Netherlands, England, Iceland, and 23 states in the United States between 1995 and 1998. The Delphi technique encourages discussion and judgments on a topic, using experts who do not normally interact. It is particularly helpful in defining concepts on a complex phenomenon from a diverse, heterogeneous, and geographically dispersed group of professionals (Scheffer & Rubenfeld, 2000).

A diverse group of professional nurses was obtained for the study who were informed it would be a 2 year study, and were given a brief description of the Delphi technique. After the initial phase of identifying the panel of experts, 86 nurses agreed to participate. There were five rounds of objectives: identification of skills and habits of mind used in critical thinking, movement towards clusters of consensual data with labels and definitions of the clusters, arrive at a consensus on the clusters with complete labels and categorization of the clusters within the habits of the mind, and arrive at a consensus summary statement of critical thinking, definitions of the habits of the mind and how to deal with the subskill (Scheffer & Rubenfeld, 2000).

Results of the Delphi study provided a strong consensus statement from a diverse group of nurse experts and provided descriptions of the components of CT and habits of the mind. Creativity and intuition were identified as two additional affective components

of critical thinking. Performance and appraisal tools could be developed using the consensus information obtained from this study. Students, educators and administrators can use this language for self evaluation and collaboration (Scheffer & Rubenfeld, 2000).

A limitation of this study was the amount of time between rounds and a lack of continued participation of some respondents. The number of participants ranged from 42 to 72 in various rounds, an acceptable number of participants; however a larger number might arrive at a broader scope of understanding. Higher numbers of participants from other countries might have increased the international perspective (Scheffer & Rubenfeld, 2000).

Faculty Perceptions of Teaching Critical Thinking

In complex clinical situations, nurses need to make wise decisions based on multiple alternatives and need to possess good critical thinking skills. This challenges nursing instructors to find the best ways to enhance students' critical thinking skills. Twibell, Ryan and Hermiz (2005) examined faculty perceptions of teaching critical thinking skills to baccalaureate nursing students in clinical experiences. Because of the lack of clarity with the concept of critical thinking, an ethnographic philosophy and method was used, a multiply case study method.

The setting was a school of nursing in the Midwestern United States. The participants were instructors with 5 or more years of clinical experience, 1 year of clinical teaching experience, and supervised junior or senior level baccalaureate student currently. The sample consisted of six nursing instructors who taught beginning adult health, child bearing/child rearing, mental health, and nursing management. All were women, and three of the instructors had advanced clinical certifications (Twibell et al., 2005).

Interviews were used to collect data. Audiotapes, transcriptions, domain and taxonomic worksheets, and reflective journals were kept by one researcher conducting the interviews. An audit trail was kept to ensure conformability and dependability. Two researchers identified biases and analyzed the data individually without collaboration to ensure rigor. Engagement with informants was prolonged and observation was persistent throughout the three step process. Fitness and transferability were judged by knowing about the informants and their contexts (Twibell et al., 2005).

The findings were that clinical faculty described indicators of critical thinking in the clinical setting with baccalaureate nursing students. The findings also suggest that perception of the respondent's definition of the nature of critical thinking share some similarities with earlier definitions of critical thinking. Respondents also agreed on four strategies for teaching critical thinking in the clinical setting. Findings support previous studies regarding reflection and acceptance of prediction and information gathering being components of critical thinking. This study did not produce findings from any respondents identifying assumptions, biases, or methods of logical reasoning. The respondents did not differentiate between critical thinking and decision making, problem solving, and clinical judgment (Twibell et al., 2005).

Conclusions were that strategies for enhancing critical thinking help nursing students make clinical judgments. Some strategies identified in this study include: case studies, role playing, reflection, group discussions, journaling, and examining alternative applications during the post clinical conference. A variety of strategies is the best approach (Twibell et al., 2005).

Changes in Critical Thinking Over Time

Critical thinking has emerged as a widely discussed concept necessary in nursing education. The purpose of this longitudinal study was the evaluation of baccalaureate nursing students' critical thinking abilities (Adams, Stover & Witlow, 1999).

The sample was 203 BSN students from a program accredited by the National League of Nursing at a state supported university in the southeastern United States. The majority were female (185), and 118 were male. The average age of participants was 23 years, with a range from 23-48 years. Students were tested in the first and last clinical courses (Adams et al., 1999).

The instrument was the Watson Glaser Critical Thinking Appraisal (WGCTA), an 80 item instrument measuring critical thinking abilities. Two forms were used, A and B for pretest and posttest, composed of five subtests: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The maximum raw score is 80, with each subtest having a maximum score of 16. The recommended time allowed is 40 minutes. Validity and reliability have been established for the WGCTA (Adams, et al., 1999).

Data were analyzed using descriptive and inferential statistics. Frequencies, measures of central tendencies, paired and independent t tests and correlation coefficients were utilized. A paired t-test showed no significant differences in the total raw scores, pre and post test on critical thinking ($t=.954$, $p=.05$). Significant differences were found in the subtests (Adams et al., 1999). The results showed that there were changes from the sophomore to senior level on critical thinking. The mean WGCTA scored for sophomores and senior levels showed differences in critical thinking scores. The authors' concluded

that critical thinking changed pre and post from the sophomore to senior years. Nurse educators are encouraged to explore other quantitative methods of measurement. Further research is needed to develop a nursing focused critical thinking instrument (Adams et al., 1999).

Teaching Strategies To Improve Critical Thinking

Angel, Duffey, and Belyea emphasized evidence based practice research to guide practice. Because student enrollment is high, team teaching is often used by a diverse group of instructors. This diversity and lack of time to prepare classes often makes team teaching difficult to co-ordinate among many sections of students. The purpose of this study was to develop evidence-based methodologies to enhance critical thinking in a large, introductory course. A pretest-posttest design was used to examine changes in critical thinking in nursing students from the beginning to the end of the first clinical semester of a baccalaureate nursing program. The focus was in two areas: acquisition of knowledge and development of critical thinking skills (Angel et al., 2000).

The sample consisted of 142 junior level nursing students for this longitudinal, quasi-experimental study. The sample included all undergraduate nursing students who completed N56: Basic Theories, Processes, and Skills for beginning clinical practice during the fall semester of 1996. The sample was 93% female and 86% white. The average age was 24 years, with a standard deviation of 5.5 years. The authors controlled for variation by balancing membership in each clinical group according to scores on the admission Watson Glaser Critical Thinking Appraisal (WGCTA). The scores ranged from 40-77, with a mean of 61 and a standard deviation of 8.1 points. All students had

access to the same experiences, lectures, textbooks, required written work and syllabus. Students completed an open ended questionnaire (Angel et al., 2000).

The authors concluded that scores did increase across the years, therefore critical thinking was measured. The authors recommended that faculty should be encouraged to use an evidenced based model to examine curricular decisions regarding teaching methods to enhance critical thinking abilities (Angel et al., 2000).

The methodology of teaching inquiry based learning was developed to give holism and flexibility in problem solving and enhance students' clinical skills. The purpose of this study was to identify if students showed an increase in critical thinking ability after being exposed to inquiry based learning methods (Magnussen, Ishida & Itano, 2000).

The setting was the University of Hawaii at Manoa. The population was newly admitted nursing students over a 4 year period, from 1991 to 1995. Inclusion was dependent upon continuation in the nursing program at Manoa (Magnussen et al., 2000).

The instrument used to measure critical thinking was the Watson Glaser Critical Thinking Appraisal (WGCTA) (1980). This tool uses similar items encountered in the clinical setting. It was administered in the 1st week of class and again during the last semester of the program. There were five subtests: inference, recognition of assumptions, deduction, interpretations, and evaluation of arguments. Reliability was not reported (Magnussen et al., 2000).

Data were collected from 228 students at entry and during the last semester of the program. From this group, 150 paired scores were collected from both admission and exit

scores. The mean scores were 56.38 at entry into the program and 55.35 at exit. There was no statistical difference between the scores (Magnussen et al., 2000).

The expectation of an increase in scores did not occur. Some students actually showed a decline from the entry scores to exit scores. The question arises whether the WGCTA is the appropriate test to evaluate nursing students' critical thinking abilities. Nursing is a science and therefore may be more accurately tested with a tool designed specifically for nursing (Magnussen et al., 2000).

Since critical thinking has been identified as an essential component of nursing practice, Bell, Heye, Campion and Hendricks et al. (2002) conducted a study to evaluate the focused learning strategy as a means of promoting critical thinking in nursing students. The organizing framework is based on Brookfield's four central components of critical thinking and five critical thinking themes.

The setting for this study was the School of Nursing at the University of Texas Health Science Center at San Antonio. The sample population was 41 junior nursing students enrolled in the first clinical course of an upper division baccalaureate nursing program. The students were members of the author's clinical group for this course. The mean age of the students was 25, 24% held a previous college degree, and 12 % had previously taken a critical thinking course (Bell et al., 2002)

Students were provided a form to record a critical incident and responses to four personal experience questions. This instrument contained the questions: What triggered critical thinking?; What resources were helpful?; What were the high and low points?; and What happened as a result of critical thinking? Faculty recorded students' responses during a conference. Students submitted a critical incident to evaluate based on the role

of the nurse as a provider of care, and most were negative rather than positive situations (Bell et al., 2002).

Discussion was enhanced by faculty maintaining a facilitator role without expressing agreement or disagreement. Using this critical thinking process provided a model that is easily used by faculty during post clinical conferences. It promoted reflection by examining perceptions, assumptions, contextual variables, and alternatives in clinical practice situations. It is a role development consistent with first semester nursing students, and it confirms conflicts associated with role socialization (Bell et al., 2002).

The critical incidents learning strategy delineates a process of critical thinking applicable to nursing. It helps clarify and focuses students of the ability to become self directed critical thinkers, with dialogue embedded in the strategy. Using clinical experience for reflection can strengthen theoretical experiential knowledge and the development of critical thinking in nursing students (Bell et al., 2002).

Examining methods of enhancing critical thinking, frequency of use, preference, and NCLEX-RN pass rates were explored by Elliott (2003). The purpose of this study was to identify teaching methodologies used by nurse educators to enhance critical thinking in nursing students.

The target population was nurse educators in the southeastern United States. The sample included 639 nurse educators in associate and baccalaureate degree nursing programs in Arkansas, Louisiana, and Mississippi. The sample represented 65 nursing programs (Elliott, 2003).

The findings were that the majority of nursing faculty completing the survey were 45-54 years old (50.1%), female (96.6%), and employed full time (95.5%). Forty-four percent were instructors and 59% taught in baccalaureate degree programs. The majority had a medical expertise (29.4%), greater than 25 years of nursing experience (50.5%), and 11-15 years of teaching experience (22.4%). NCLEX-RN pass rates were examined to identify differences in pass rates and methodologies used by educators (Elliott, 2003).

A descriptive survey was developed for this study (Gall & Borg, 2001; Gall & Trochim, 2001) asking both general and specific nursing demographic questions. Nurse educators were asked to indicate methods used to teach critical thinking, frequency of use and methodology preferences. Responses were formatted for structured and unstructured dichotomous responses, nominal level responses; fill in the blank, check box, and interval level responses using a Likert scale (Elliott, 2003).

This tool was developed after discerning that no good tool had been established. This increased the significance of the study because the study encompassed three states. To establish the validity and reliability of the instrument, a pilot study was conducted with 30 participants from associate degree (15) and baccalaureate (15) nursing programs. Participants of the study provided feedback regarding accuracy and clarity of information obtained both during and after the data was gathered. Faculty was also asked to give feedback and suggestions for improvement. Revision continued until all instrument items were clearly stated (Elliott, 2003).

The findings from the survey were that the majority of nursing faculty completing the survey were 45-54 years old (50.1%), female (96.6%), and employed full time (95.5%). Forty-four percent were instructors and 59% taught in baccalaureate programs.

The majority had a medical expertise (29.4%), greater than 25 years of nursing experience (50.5%), and 11-15 years of teaching experience (22.4%). Newborn-Maternal nursing was second (14.2%) to medical nursing (29.4%) as the primary area of nursing expertise (Elliott, 2003).

Next, nurse educators were asked to indicate the frequency of use of each teaching method. The findings were as follows: group discussions/activities (N=618, 96.7%), case studies (N=601, 94.1%), and self- assessments (N=517, 80.9%) were the top three teaching strategies used. The mean frequency of case study use was 6.88 with a standard deviation of 2.73. The mean frequency of self-assessments use was 6.57 and had a standard deviation of 3.61 (Elliott, 2003).

Question two was answered with the highest response being group discussions (N=212, 33.3%) as the teaching method used, followed by case studies (N=210, 32.9%). The teaching method preferred was case studies (N=251, 39.3%), followed by group discussions/activities (N=210, 32.9%) (Elliott, 2003).

To identify significant differences in the mean frequencies of usage, ANOVA was used to compare of NCLEX-RN pass rates. There were no significant differences found. Based on teaching methods, a Chi square analysis was conducted to determine significant differences between teaching methods and specific demographic characteristics of faculty. The categories measured years of nursing experience, years of teaching experience, faculty appointment, employment status, nursing program level, age range, gender and primary area of expertise.

The conclusion from this study was that faculty used different teaching strategies and preferred case studies. Critical thinking has become an integral component in all

levels of nursing education. This generated the need to identify and develop teaching methodologies to enhance critical thinking (Elliott, 2003).

The National League for Nursing Accreditation commission identified critical thinking as an explicit program outcome. Walsh and Seldomridge (2006) examined the effects of classroom technology on critical thinking as well as teaching strategies utilized to enhance critical thinking in nursing students. The purpose of this study was to identify reliable and valid ways to systematically assess growth in critical thinking of nursing students.

The setting was Salisbury University, School of Nursing in Maryland. The population included nursing students across the United States. Students must be enrolled in a nursing program in the United States (Walsh & Seldomridge, 2006).

The California Critical Thinking Dispositions Inventory (CCTDI) (Facione, 1992) was chosen to evaluate critical thinking dispositions, including truth seeking, open-mindedness, analyticity, systematicity, confidence, inquisitiveness, and maturity. The Watson-Glaser Critical Thinking Appraisal, Form S (WGCTA) (Watson & Glaser, 1994) was selected to measure the underlying constructs of classical logic in critical thinking skills, including inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. Both were relatively inexpensive, reliable, and could be administered during a one hour time frame, and could be scored by hand (Walsh & Seldomridge, 2006).

The findings that were collected from 1997 to 2002 showed no consistency. Some showed gains in critical thinking skills, some showed losses, and many had essentially no

change. The authors concluded a nursing specific instrument needs to be developed (Walsh & Seldomridge, 2006).

Using logic models enhance critical thinking. Using logic clarifies concepts from concrete to abstract levels. The purpose of this study was to share one school's experience in the integration of logic to enhance student's critical thinking abilities. Ellermann, Kataoka-Yahiro and Wong (2006) examined experiences and methods that support the development and enhancement of critical thinking skills in undergraduate nursing students. The setting was the School of Nursing and Dental Hygiene at the University of Hawaii at Manoa. The population included undergraduate nursing students and faculty at the University of Hawaii at Manoa. The survey was completed in class and all students participated (Ellermann et al., 2006).

A survey with six closed-ended questions and two open-ended questions was completed by all students in the nursing program at the University of Hawaii at Manoa to measure the variables. The specific instructional methods included concept mapping, concept papers, conceptual linking, and substruction that were rated and recorded. On a scale of 1=very low to 10=very high, the responses were entered into the Statistical Package for the Social Services, version 12 to analyze frequencies, percentages, and paired t tests. The project was deemed exempt by the University Institutional review Board (Ellermann et al., 2006)

Students rated perceptions of critical thinking when beginning the nursing program (mean=3.4, SD=2.0) and again at the end (mean =7.6, SD=1.3). Students rated the degree to which logical thinking enhanced critical thinking (mean=6.9, SD=1.9), capability to make clinical decisions (97%), and comfort level in making decisions

(mean=7.0, SD=1.5). Students were also asked what methods were used in making clinical decisions. Nursing process (100%), logical reasoning (84%), research (72%), concept mapping (64%), concept paper (45%), and conceptual thinking (42%) were identified (Ellermann et al., 2006).

The findings also showed that logic models can contribute to the enhancement of critical thinking in undergraduate nursing students. The logic models can help move the novice toward expertise in clinical reasoning, supporting dynamic, multidimensional and creative thinking needed in our complex health care environment (Ellermann et al., 2006). Logic models are useful in clarifying the nursing process and promoting different scientific ways of using data to focus on the client's whole context of human health. The models add a multidimensional and more complex view of nursing problems (Ellermann et al., 2006).

Barriers to Teaching Critical Thinking

Barriers to teaching critical thinking were examined by Shell because critical thinking is an essential skill of nursing graduates and nursing practice. The purpose of this study was to identify barriers to effective critical thinking (Shell, 2001).

The population consisted of all nurse educators who currently teach in one of 15 generic baccalaureate programs in Tennessee. A total of 262 nurse educators were identified through telephone calls, internet searches, and letters. Included in the study were 175 respondents (Shell, 2001).

The investigator developed a questionnaire, Survey of Perceived Barriers to Teaching Critical Thinking by BSN faculty. There were three parts to the questionnaire: demographic data closed ended statements regarding barriers faculty encounter, and

rating to what extent the barriers interfere with ability to implement critical thinking strategies (Shell, 2001). There were 52 items on the survey, and it was tested for validity and reliability by a panel of four members chosen for expertise and experience in critical thinking. A Likert scale was used with 1= no perceived barrier to 5= greatest barrier (Shell, 2001).

The findings were that the overall critical thinking barrier score mean was 41.73 on a scale from 0 to 100. This indicated that student characteristics (M=60.28), time constraints (M=58.61), and content coverage (M=51.09) were identified as the greatest barriers to teaching critical thinking. One minor barrier was faculty self-efficacy, and the relevance of critical thinking was the lowest barrier score (Shell, 2001).

Conclusions were that student characteristics were the biggest barrier to teaching critical thinking with BSN students. Further research is needed to explore to what degree student characteristics inhibit teaching critical thinking in the classroom (Shell, 2001).

Predictors of Critical Thinking

A longitudinal descriptive study was conducted by Stewart and Dempsey to examine nursing students' dispositions toward critical thinking as students moved from the sophomore to senior years in a baccalaureate nursing program in the Midwestern United States. The research looked for significant correlations between critical thinking dispositions and Educational Resources, Inc., (ERI), RN assessment scores and GPA (Stewart & Dempsey, 2005).

The setting was the School of Nursing at the University of Wisconsin-Oshkosh. The population included nursing students enrolled in the sophomore and senior levels of the baccalaureate nursing program. The mean age was 22.96 and the mean GPA was 3.0.

Of the 55 participants, 44 students were single, 7 were married, and 4 were divorced (Stewart & Dempsey, 2005).

The California Critical Thinking Disposition Inventory (CCTDI) (Facione & Facione, 1992) was used to identify whether the students' critical thinking dispositions improved as a result of undergraduate educational experience. Students were tested at the beginning of the 4 year program and again at the beginning of the students' final semester. Seventy-five items tested seven aspects: truth seeking, open-mindedness, analyticity, systematicity, self confidence, inquisitiveness, and maturity of critical thinking disposition. The reliability of the test was .90 (Stewart & Dempsey, 2005).

The findings were that that there were no significant differences or correlations between any of the subscales under investigation. Overall, there were no significant increases in critical thinking dispositions between the sophomore and senior levels, regardless of the teaching strategies used (Stewart & Dempsey, 2005). The authors concluded that critical thinking dispositions may not improve as students complete a nursing program. The authors suggest a need for discipline specific tool to evaluate critical thinking dispositions in nursing students (Stewart & Dempsey, 2005).

Another study acknowledged the importance of critical thinking in nursing education and practice. Because NCLEX-RN reflect competency for entry level nurses, most questions are written at the cognitive and analysis level, critical thinking is needed for success on the NCLEX-RN. The authors examined the relationship of critical thinking to scores on the NCLEX-RN (Giddens & Gloeckner, 2005).

This correlational study sample consisted of 218 baccalaureate nursing students from a southwestern United States university based program. There were 22 men and 196

women with a mean age of 30.3 years. GPA was evaluated to compare findings with other current studies. Giddens and Gloeckner (2005) found differences with the sample population in ethnic distribution (39% minority students in the sample, 20% in the RN population in the United States).

The instruments used were the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI). The CCTST and the CCTDI were administered at the beginning of the program and again during the last semester of the program. The CCTST is discipline neutral generating six scores: a total score and five subscale scores. The subscales included: analysis, evaluation, inference, inductive reasoning and deductive reasoning (Giddens & Gloeckner, 2005).

The CCTDI measures attitudinal dimensions of critical thinking and to what extent the disposition of the person is that of an ideal thinker. There are 75 statements using a 6-point Likert scale. It generates a total score and seven sub scores (truth seeking, inquisitiveness, open-mindedness, confidence, analyticity, systematicity, and maturity (Giddens & Gloeckner, 2005).

Findings demonstrated differences between sample scores and the national mean with ethnic distribution having 39% of minority students in the sample and 20% in the population of RNs in the United States, critical thinking disposition and NCLEX-RN scores (93% pass rate of sample, 85% national pass rate) (Giddens & Gloeckner, 2005).

Disposition scores between graduates who failed or passed the NCLEX-RN and differences between entry and exit critical thinking skills were evaluated. On entry CCTST, the pass group exceeded the fail group scores, and the difference for the three

scores was statistically significant, with large effect sizes. Independent t-tests, however showed no difference between pass and fail groups.

On exit CCTST, the pass group had significantly higher mean scores on all six scores, with a medium to large effect size. The comparison of mean scores for the CCTDI also showed statistically significant differences, with the pass group exceeding the fail group. A t-test showed no statistically significant difference between groups, so there was no relationship between changes in critical thinking over time and scores on the NCLEX-RN exam (Giddens & Gloeckner, 2005).

Using discriminant analysis to correctly classify students into pass or fail groups, based on CCTST and CCTDI total scores was correct for the 98% of students who passed the NCLEX-RN, and incorrect for the 79% who failed the NCLEX-RN exam. The results supported the theory that there is a relationship between critical thinking and NCLEX-RN scores. There was no significant difference in mean scores for the CCTDI between groups. The relationship of CCTDI to NCLEX-RN remains unclear (Giddens & Gloeckner, 2005).

Instrumentation for Critical Thinking

No consensus exists on the measurement or definition of critical thinking in online courses. The purpose of this study was to develop and test a tool to evaluate critical thinking skills in online courses in three masters' level courses in a Midwestern School of Nursing (Ali, Bantz & Siktberg, 2005). The sample was master's level students participating in online courses in a Midwestern nursing school.

The findings were based on analysis, synthesis, and evaluation in each particular case scenario by each faculty investigator. The results showed that interrater reliability

for each item and for the three subscales were adequate. The subscale that addresses reasoning was “low” however. Refining the items may be achieved by requesting feedback from the graduate students (Ali, et al., 2005).

Conclusions for the authors were: the content of the 10 item tool that used a Likert scale to evaluate critical thinking was validated by a panel of experts and reliability and consistency were adequate. The critical thinking skills were adequately measured by the tool in the areas of analysis and synthesis, however, it was questionable in the area of evaluation. Further testing is needed in relation to the validity and reliability of the tool (Ali et al., 2005).

Summary

Today’s highly complex health care system requires nurse educators to focus curriculum and teaching strategies on the enhancement of critical thinking. The challenge of how to effectively enhance critical thinking in nursing needs further investigation. The purpose of this study is to determine what strategies are utilized by nurse educators to enhance critical thinking in nursing students. The findings will be useful in helping nurse educators determine which methodologies are most useful for enhancement of nursing students’ critical thinking skills.

The consensus statement on critical thinking in nursing provided a definition as follows:

Critical thinking in nursing is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance,

and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge (Scheffer & Rubenfeld, 2000, p.357).

Findings from the faculty perceptions of teaching critical thinking study were that clinical faculty can describe indicators of critical thinking in baccalaureate students. The findings also suggested that the perception of the respondents' definition of the nature of critical thinking share some similarities with earlier definitions of critical thinking. Respondents agreed on four strategies for teaching critical thinking in the clinical setting. Findings support previous studies regarding reflection and acceptance of prediction and information gathering being components of critical thinking. This study did not produce findings from any respondents identifying assumptions, biases, or methods of logical reasoning. The respondents did not differentiate between critical thinking and clinical decision making, problem solving, and clinical judgment (Twibell et al., 2005).

Further research is needed to develop a nursing focused tool to measure critical thinking in nursing students. The Watson Glaser Critical Thinking Appraisal, an 80 item instrument was used to evaluate the critical thinking abilities of baccalaureate students from a state supported school of nursing in the southeastern United States. The authors concluded that critical thinking changed pre and post from the sophomore and senior years. Nurse educators are encouraged to develop a nursing focused critical thinking instrument (Adams et al., 1999).

Angel, Duffey, and Belyea emphasized evidence based practice research to guide practice. Because student enrollment is high, team teaching is often used by a diverse group of instructors. This diversity and lack of time to prepare classes often makes team teaching difficult to co-ordinate among many sections of students. The purpose of this study was to develop evidence-based methodologies to enhance critical thinking in a large, introductory course. The authors concluded that scores did increase across the years, therefore critical thinking was measured. The authors recommended that faculty should be encouraged to use an evidence based model to examine curricular decisions regarding teaching methods to enhance critical thinking abilities (Angel et al., 2000).

The methodology of teaching inquiry based learning was developed to give holism and flexibility in problem solving and enhance students' clinical skills. Identification of the increase in students' critical thinking skills after being exposed to inquiry based learning methods was explored at the University of Manoa from 1991 to 1995. The expectation of an increase in scores did not occur. This study supported the need for a nursing focused tool to evaluate critical thinking in nursing students (Magnussen et al., 2000).

The School of Nursing at the University of Texas Health Science Center at San Antonio was the setting for the study where views on critical thinking were explored using a critical incident found in the clinical setting. This method provided reflection by examining perceptions, assumptions, contextual variables, and alternatives in clinical practice situations. The authors found that using reflection can strengthen theoretical

experiential knowledge and the development of critical thinking in nursing students (Bell et al., 2002).

Elliott (2003) examined methods of teaching critical thinking, frequency of use, preference, and NCLEX-RN pass rates. A descriptive study was used, having 639 nurse educators in nursing programs from Arkansas, Louisiana, and Mississippi. The authors concluded that faculty used different teaching strategies and preferred case studies (Elliott, 2003).

Walsh and Seldomridge (2006) examined the effects of classroom technology on critical thinking as well as the teaching strategies utilized to enhance critical thinking in nursing students. The findings that were collected from 1997 to 2002 showed no consistency. Some students showed gains in critical thinking skills, some showed losses, and many had no change. This study also supported a need for a nursing specific tool to evaluate and measure critical thinking skills in nursing students (Walsh & Seldomridge, 2006).

Ellermann, Kataoka-Yahiro and Wong (2006) examined one school's integration of logic to enhance critical thinking in nursing students. Students' perception of critical thinking from the beginning of the program to the final semester was evaluated. The findings showed that logic models can help clarify the nursing process and move the novice toward expertise in clinical reasoning. The model adds a multidimensional and more complex view of nursing problems (Ellermann et al., 2006).

Barriers to teaching critical thinking were examined by Shell (2001). This study found that student characteristics were the biggest barrier to teaching critical thinking in baccalaureate students. Further research is needed to examine to what degree student characteristics inhibit teaching critical thinking in nursing students (Shell, 2001).

A longitudinal descriptive study was used to examine predictors of critical thinking in nursing students by Stewart and Dempsey (2005). The research looked for significant correlations between critical thinking dispositions and Educational Resources, Inc., assessment scores and GPA. The authors concluded that critical thinking dispositions may not improve as students complete a nursing program. The authors suggest a need for a nursing specific tool to measure critical thinking dispositions in nursing students (Stewart & Dempsey, 2005).

Giddens and Gloeckner examined the relationship of critical thinking scores to the NCLEX-RN pass rates in 2005. No statistically significant differences were found, showing there was no relationship in critical thinking over time and scores on the NCLEX-RN pass rates (Giddens & Gloeckner, 2005).

Development and testing of a nursing specific tool to measure or define critical thinking was the purpose of a study by Ali, et al., (2005). Online courses in three masters' level courses in a Midwestern School of Nursing were used in the evaluation. The findings were based on analysis, synthesis, and evaluation in each particular case scenario by each faculty investigator. Conclusions were that the critical thinking skills were adequately measured by the tool in the areas of synthesis and analysis, however, it was

questionable in the area of evaluation. Further testing is needed in relation to the validity and reliability of the tool (Ali et al., 2005).

Chapter Three

Methodology and Procedures

Introduction

Critical thinking is an essential function of nursing and is an expected outcome for nursing education. Nursing faculty is challenged to prepare nursing students for clinical practice settings that require critical thinking. Teaching requires faculty to use effective strategies to enhance critical thinking skills (Elliott, 2003). The purpose of this study is to describe teaching strategies used by faculty to develop critical thinking skills of nursing students. This is a replication of Elliott's (2003) study.

Research Question

What teaching strategies are used by faculty to develop critical thinking in nursing students?

Population, Sample, and Setting

The study will take place in Indiana. The sample will be all nursing faculty from all associate degree programs within the Ivy Tech Community College system statewide (N=112). The anticipated population will be approximately 50 nursing faculty teaching in the associate degree programs from 14 Ivy Tech Community College nursing programs. The criterion for inclusion in the study is nursing faculty teaching in an associate degree program at Ivy Tech community College for at least 1 year in the state of Indiana.

Protection of Human Subjects

Permission for the study will be gained from Ball State University and Ivy Tech Community College Institutional Review Board. Participants will be provided information regarding the purpose and procedures of the study. Participants will be informed that the study is voluntary with the option to withdraw at any time. The estimated time required for completion of the survey is 15 minutes. All data obtained from the study will be kept confidential, and no names will be used. The participants will be given the opportunity to review the results. No risks have been identified for participation in the study. The benefit of the study will be to determine what teaching strategies are used by nursing faculty to enhance critical thinking in nursing students.

Procedures

Meetings have been prearranged with both Ball State University and Ivy Tech community College to obtain permission for the study. Once permission has been granted by Ball State University and Ivy Tech Community College, permission will be elicited from the Department Chair of Nursing and the Dean at Ivy Tech Community college. Nursing instructors will be mailed a cover letter, a questionnaire, and a stamped envelope addressed to the researcher. The researcher will assume complete responsibility for collecting all data. Faculty will return questionnaires to the researcher through the provided addressed, stamped envelope, by mail.

Methods of Measurement

Participants will complete a survey asking both specific and general nursing demographic questions. Nurse educators will be asked to indicate methods used to enhance critical thinking, frequency of use and methodology preferences. The Critical

Thinking Questionnaire (Gail et al., 1996; Trochim, 2001), as cited in Elliott, (2003) will be used to measure teaching strategies. Ten choices will be provided with a standard definition of each method. The choices include: concept mapping, case studies, journaling, group discussions, formal critical thinking instruction, journal article critiques, mind mapping, reflection, self assessments, and team teaching. Participants will check all methods used. A Likert scale will be used to measure how frequently each method is used to enhance students' critical thinking/clinical decision making. The 10 point scale will range from 1= never used to 10= used every class. The response formats will be structured, using check boxes, and interval level responses (Likert scale). The estimated time required for completion of the survey is 15 minutes.

Research Design

The design for this study is descriptive. A descriptive design first identifies the phenomenon and its variables; the design then identifies conceptual and operational definitions of variables. A descriptive design also describes the variables in a study. This design method describes what exists in a real life situation and determines frequency, thereby giving meaning to research (Burns & Grove, 2005).

Data Analysis

Frequencies and percentages will be reported as teaching methodology and frequency of use. Descriptive statistics will help the researcher organize the information in a way that gives meaning (Burns & Grove, 2005, p. 734).

Summary

The purpose of this study is to identify methods used by faculty to enhance critical thinking/clinical decision making in nursing students. The Critical Thinking

Questionnaire will be used to collect data from faculty teaching in one of 14 Ivy Tech community college nursing programs in Indiana. The Critical Thinking Questionnaire will be used to collect all data. Descriptive statistics will be used to analyze data.

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Source	Problem	Purpose Research Questions	Framework or Concepts	Sample	Design	Instruments	Results
1. Elliott (2003)	Nurses need CT skills, educators need to know how to enhance CT skills in nursing students	Identification of effective teaching strategies to enhance CT skills in nursing students. Question: What teaching methods are used to enhance CT in nursing students?	Teaching methods/strategies	639 nurse educators in BSN programs in Arkansas, Mississippi & Louisiana	Descriptive	Descriptive survey – methods to teach critical thinking Frequency & methodologies	No significant differences found Group discussions, case studies, self assessments with group discussions being highest
2. Giddens & Gloeckner (2005)	Critical Thinking is integrated into the NCLEX, therefore students need to have good CT skills to pass NCLEX	Examination of relationship of CT skills to NCLEX pass rates	NCLEX-RN success	218 Baccalaureate nursing students from a Southwestern University based program	Correlational	California Critical Thinking Disposition Inventory (CCTDI), California Critical Thinking Skills Test (CCTST)	39% of students in this study were minority; population is 29% in US. The pass group had no significantly different scores on CT.

Source	Problem	Purpose Research Questions	Framework or Concepts	Sample	Design	Instruments	Results
3. Angel, Duffey & Belyea (2000)	Education needs to be evidence-based	To develop evidence-based methods of enhancing CT in a large, introductory course. What evidence-based methods are used in large intro courses?	Evidence-based practice for critical thinking	142 nursing students in undergraduate nursing program	Longitudinal, quasi-experimental	Watson-Glaser Critical Thinking Appraisal (WGCTA)	Significant differences between all knowledge and CT measures.
4. Shell (2001)	Barriers to teaching CT & nursing students	Evaluation of barriers to CT in nursing undergraduate education. What barriers exist?	Barriers to teaching critical thinking	All nurse educators in 15 programs in Tennessee	Descriptive	Survey of barriers to teaching critical thinking. 52 items	Student characteristics were the biggest barrier. CT barrier with a mean 41-73/100
5. Adams, Stover & Whitlow (1999)	Evaluation of BSN student CT abilities	CT is needed for successful practice. Do CT score improve over time in nursing education?	Critical thinking	203 BSN students from state University in southeastern US	Longitudinal	WGCTA	There were changes from sophomore to senior levels in CT
6. Ali, Bantz & Siktberg (2005)	Evaluation of CT in online responses	To develop and test a tool to evaluate CT in online responses	Critical thinking definitions	Masters level students in 3 online courses	Descriptive	Likert scale-10 item instrument measuring analysis, synthesis and evaluation	Further testing need to validate tool

Source	Problem	Purpose Research Questions	Framework or Concepts	Sample	Design	Instruments	Results
7. Ellermann, Yahiro & Wong (2006)	CT needs to be enhanced in nursing students	To share one schools experience in using logic models to enhance CT. Can CT be enhanced through the use of logic models?	Logic Model	Undergraduate nursing students at University of Hawaii-Manoa	Non-experimental-descriptive	Six questions, 2 open-ended on instructional methods	Logic models can contribute to the enhancement of Ct in nursing students. Clinical decisions, comfort needs, process & research
8. Magnussen, Ishida & Itano (2000)	Teaching needs to be holistic in nursing	Sought to determine if inquiry-based learning enhances CT. Does IBL enhance CT in undergraduate nursing students?	Inquiry Based Learning	228 Newly admitted nursing students at University of Hawaii-Manoa	Longitudinal	WGCTA	Increase in scores did not occur
9. Bell, Heye, Camion & Hendricks (2002)	CT is an essential component of nursing education	Evaluation of process-focused learning as an effect CT enhancing strategy. Does process-focused learning enhance CT skills?	Brookfield's components of CT	41 junior nursing students enrolled at the University of Texas Health Center at San Antonio	Non-experimental-predictive	Questionnaire: 4 open-ended questions	Using clinical experience for reflection can enhance CT in nursing students

Source	Problem	Purpose Research Questions	Framework or Concepts	Sample	Design	Instruments	Results
10. Stewart & Dempsey (2005)	Students need to improve CT skills for effective practice	To determine effective teaching strategies for enhancing CT in nursing students. Are there significant correlations between Educational resources, RN assessments, and GPA?	Critical Thinking Dispositions	All nursing students enrolled in sophomore to senior level at University of Wisconsin-Oshkosh	Comparative descriptive study	California Critical Thinking Disposition Inventory	No significant differences between the subscales examined between sophomore and senior levels
11. Walsh & Seldomridge (2006)	NLNAC identified CT as an explicit outcome in 1997	Examined classroom technologies effects on CT What reliable teaching strategies are used to enhance CT?	Teaching strategies for evaluation	Students in nursing programs across the United States	Descriptive	CCTDI & WGCTA	No consistency- some gains & some losses
12. Twibell, Ryan & Hermiz (2005)	Good CT skills are need in clinical practice	Examined faculty perceptions of teaching CT to students in the clinical setting.	Ethnographic philosophy- multiple case studies	Six nursing instructors in a public, Midwestern school of nursing	Multiple case studies	Interviews using audiotapes, transcriptions & reflective journals	Clinical faculty can describe indicators in the clinical setting to determine CT ability of students, and agreed on four5 strategies to enhance CT in students

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